

# Director's Report to the National Advisory Council on Drug Abuse

September 8, 2016

Nora D. Volkow, M.D., Director



National Institute  
on Drug Abuse



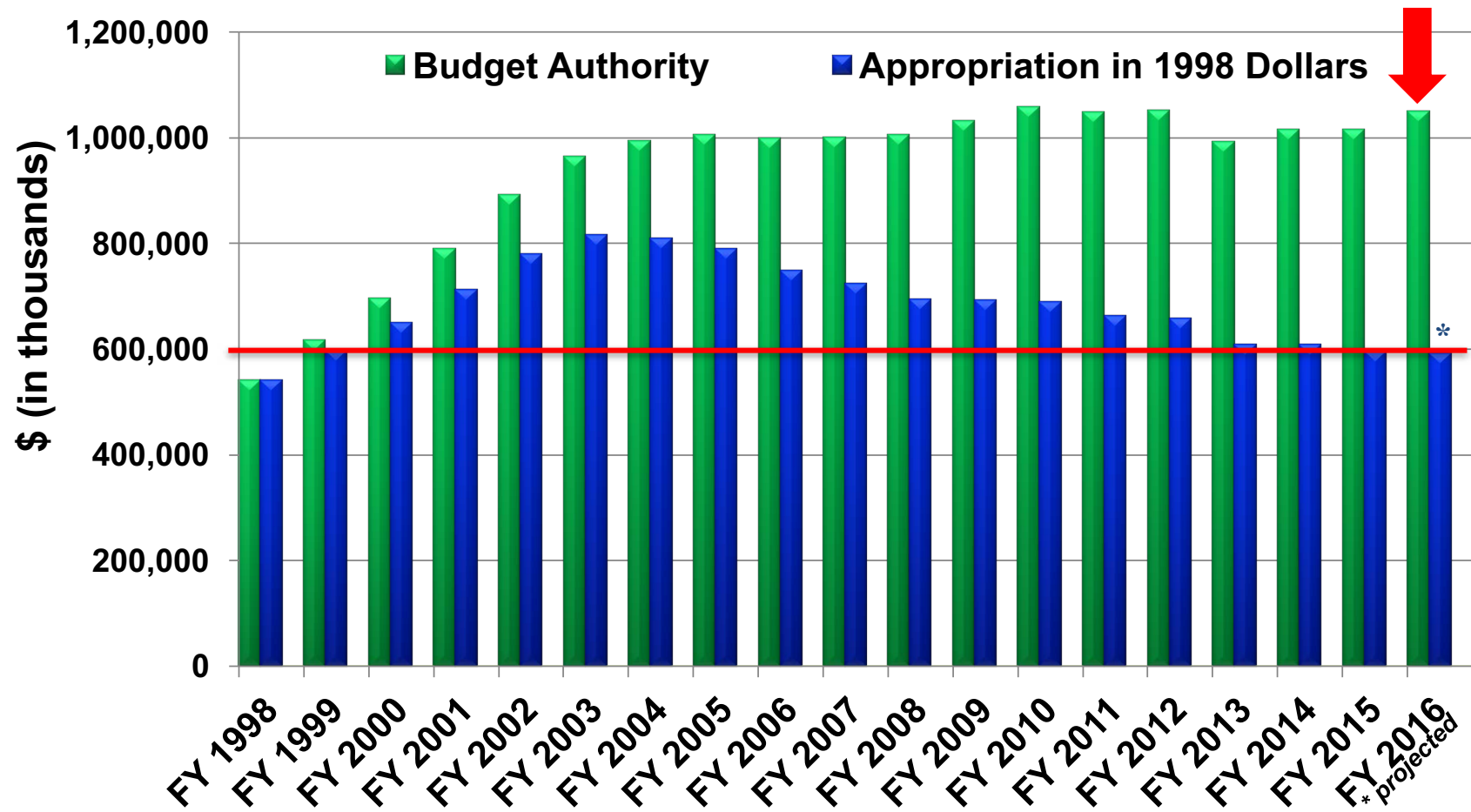
@NIDAnews

# NIDA BUDGET

(Thousands)

	<b>FY 2015</b> Actuals	<b>FY 2016</b> Operating Plan	<b>FY 2017</b> PB	<b>FY 2017</b> Senate Markup
NonAIDS	\$716,833	\$756,306	\$756,306	
AIDS	\$298,862	\$294,244	\$294,244	
<b>TOTAL</b>	<b>\$1,015,695</b>	<b>\$1,050,550</b>	<b>\$1,050,550</b>	<b>\$1,103,032</b>

# NIDA Program Level in Appropriated Dollars and Constant 1998 Dollars



**30% of AIDS Budget, which is for AIDS research is re-competed based on NEW NIH HIV priorities**

# **Director's Report to the National Advisory Council on Drug Abuse**

- **Budget Update**

- **What's New @ HHS/NIH?**

- **Recent NIDA  
Activities & Events**

# **Joshua A. Gordon, M.D., Ph.D**

Director, National Institute of Mental Health



- Associate Professor Psychiatry, Columbia University Medical Center and New York State Psychiatric Institute
- Associate Director, Adult Psychiatry Residency Program
- Research on mice with relevant mutations to schizophrenia, anxiety and depression (neurophysiology and optogenetics)
- M.D./Ph.D. University of California, San Francisco
- Psychiatry Residency and Fellowship at Columbia University

THE BRAIN INITIATIVE®

# BRAIN: *Where Are We?*



**President  
Announces  
BRAIN  
Initiative**

*April 2013*

**1st meeting of  
the BRAIN  
MCWG**  
*August 2014*



**1st BRAIN PI  
meeting**  
*November  
2014*

**Neuroethics  
Workgroup  
Established**  
*August 2015*



**2nd BRAIN PI  
meeting**  
*December 2015*

**MCWG reviews  
FY 2016  
Pay Plans**  
*August 2016*

**BRAIN  
2025  
Report  
released**  
*June 2014*



**1st NIH BRAIN  
awards**  
*September 2014*

**1st BRAIN  
Initiative Alliance  
discussion**  
*July 2015*



**2nd NIH BRAIN  
awards**  
*September 2015*

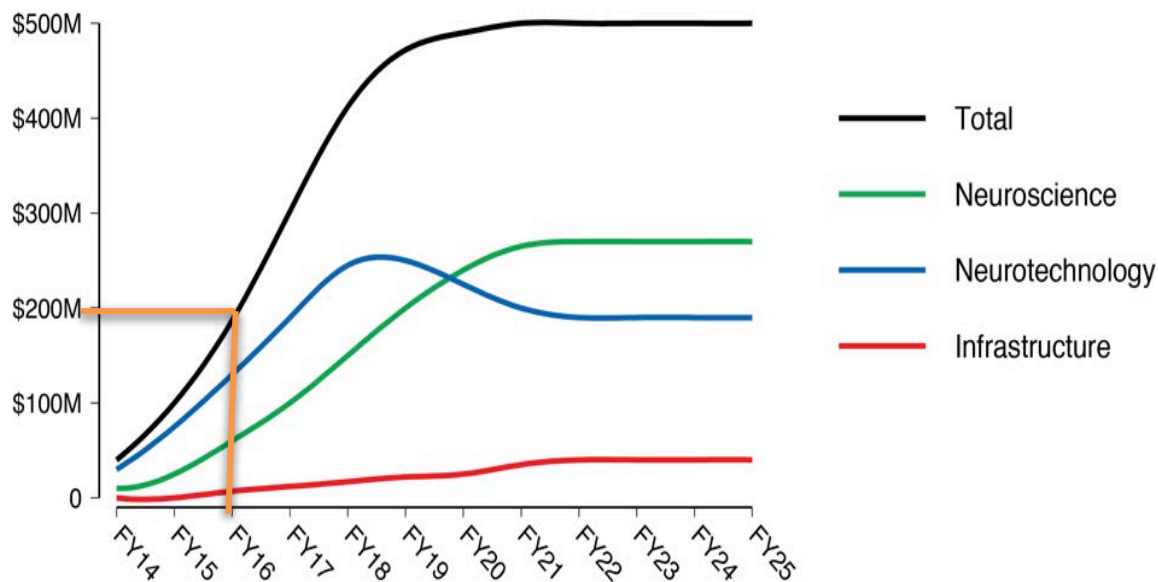
**MCWG clears  
FY 2016  
Concepts**  
*February 2016*



**National Institutes of Health**  
*Turning Discovery Into Health*

# THE BRAIN INITIATIVE®

## Recommended Budget BRAIN WG



Ramp up \$400M/yr by FY 2018  
Plateau at \$500M/yr by FY2021  
**Total \$4.5B by FY 2025**



Anne Churchland  
@anne\_churchland



Following

Who aims to shape the future of  
#neuroscience ? @NINDSdirector just  
announced #NIH seeks #BRAIN Initiative  
director



Walter J. Koroshetz @NINDSdirector

#NIH seeks visionary scientist to Direct #BRAIN Initiative, apps  
reviewed starting Aug 8: 1.usa.gov/28QXgzO

RETWEETS

9

LIKES

7



6:38 AM - 27 Jun 2016

NIH is recruiting

- New **BRAIN Director**
- New **BRAIN Program Directors/Analysts** that will split time between BRAIN and the BRAIN-ICs where they are embedded

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- **Budget Update**
- **What's New @ HHS/NIH?**

- **Recent NIDA  
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# Priority Areas

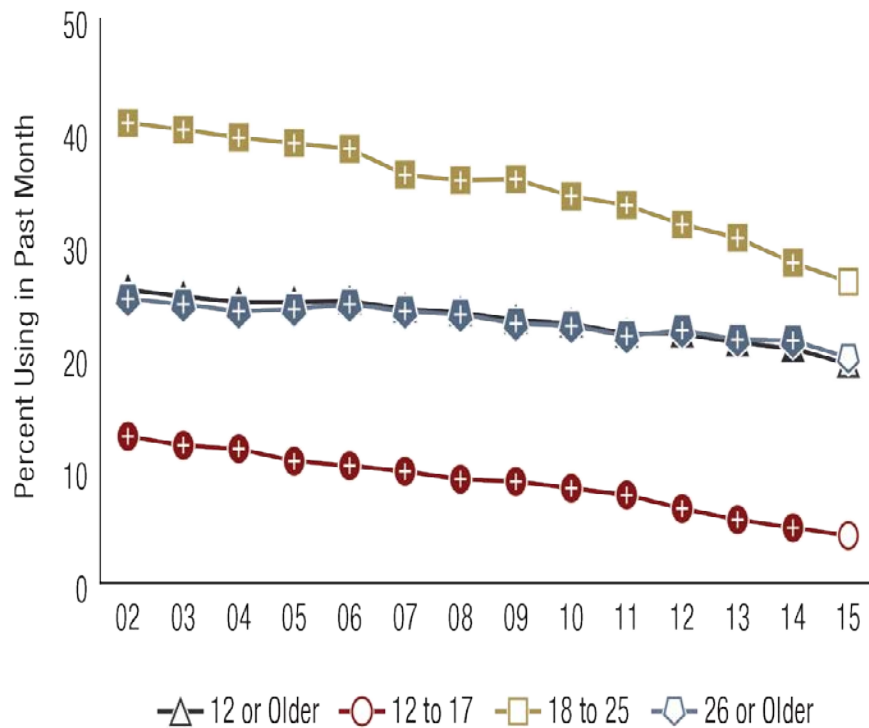
## Prevention Research

**(Children & Adolescents)**  
genetics/epigenetics  
development  
environment  
co-morbidity

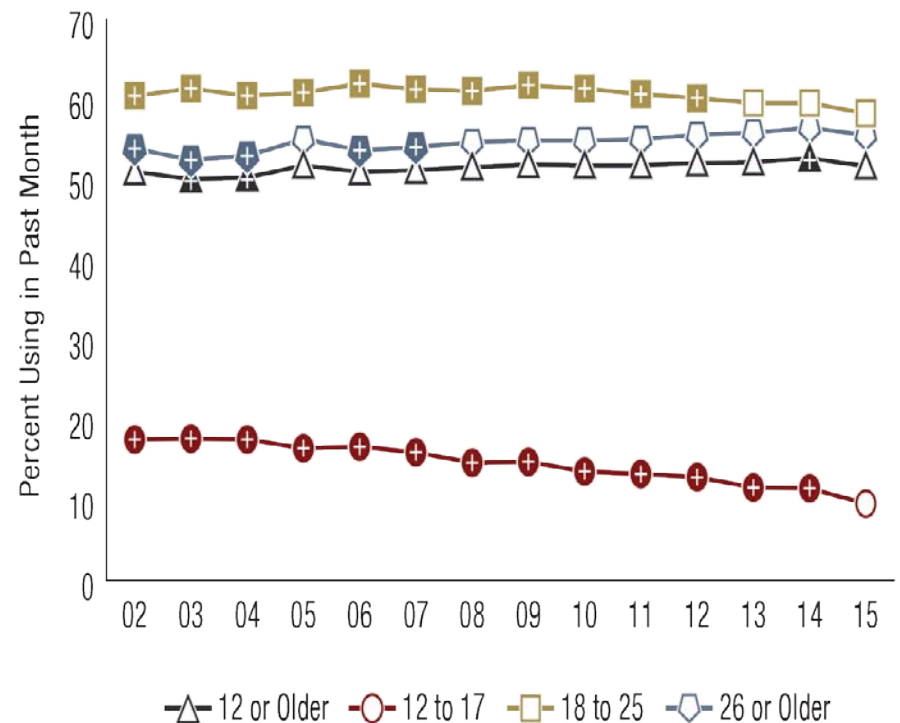


# 2015 National Survey on Drug Use and Health

**% Past Month Cigarette Use  
Aged 12 or Older**



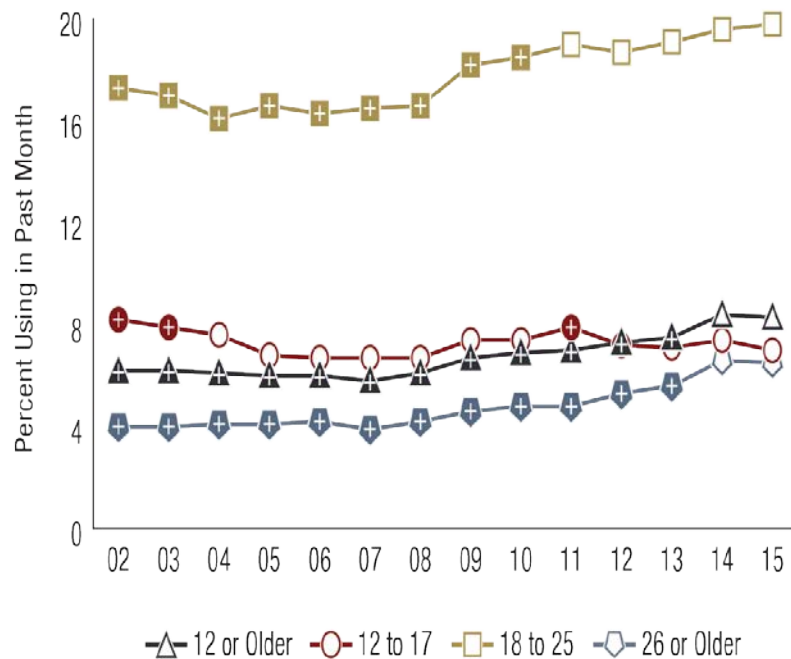
**% Past Month Alcohol Use  
Aged 12 or Older**



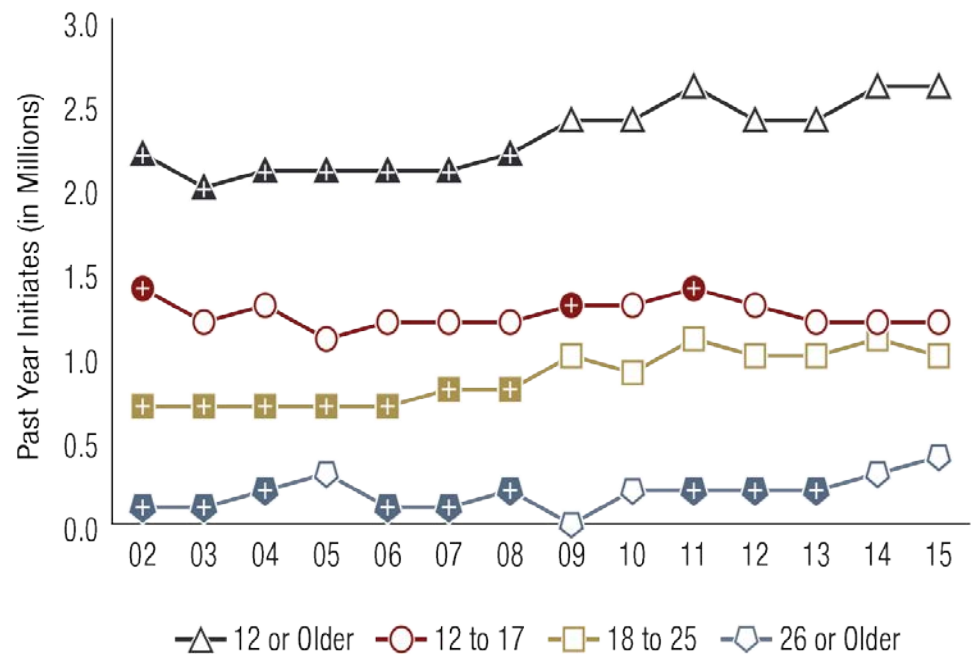
+ Difference between this estimate and the 2015 estimate is statistically significant at the .05 level.

# 2015 National Survey on Drug Use and Health

## % Past Month Marijuana Use Aged 12 or Older

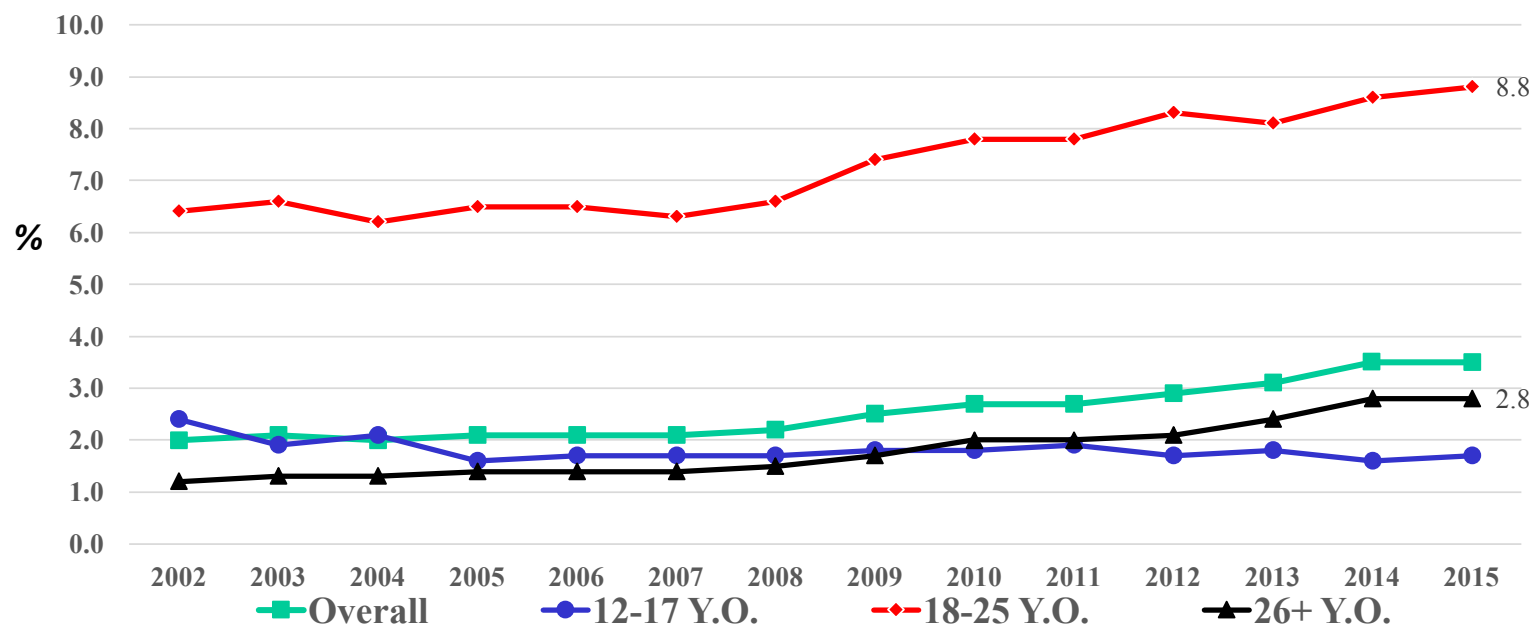


## Past Year Marijuana Initiates Aged 12 or Older, by Age Group (in Millions)



+ Difference between this estimate and the 2015 estimate is statistically significant at the .05 level.

# Daily or Near Daily Marijuana Use in Past Month among Persons Aged 12 or Older in the United States, 2002-2015



***SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health***

# Marijuana and Cannabinoids: A Neuroscience Research Summit

March 22–23, 2016

NIDA, NIAAA, NCCIH, NIMH, NINDS

- Addressed adverse and potential therapeutic effects of marijuana to neurological, psychiatric disorders and pain, other cannabinoids, and the endocannabinoid system.
- Goal: to ensure evidence-based information is available to inform practice and policy, particularly relevant at this time given the shifting landscape regarding the recreational and medicinal use of marijuana

*Meeting Summary can be found at:*

<https://www.drugabuse.gov/sites/default/files/briefmjsummitmeetingsummary.pdf>



Hawaii J Med Public Health. 2014 Sep; 73(9): 283–287.

## **Marijuana Use and Maternal Experiences of Severe Nausea During Pregnancy in Hawai‘i**

Emily K Roberson, PhD, MPH, Walter K Patrick, MD, PhD, MPH,† and Eric L Hurwitz, DC, PhD

In Hawaii 6.0% women reported using marijuana the month before pregnancy, and 2.6% during pregnancy.

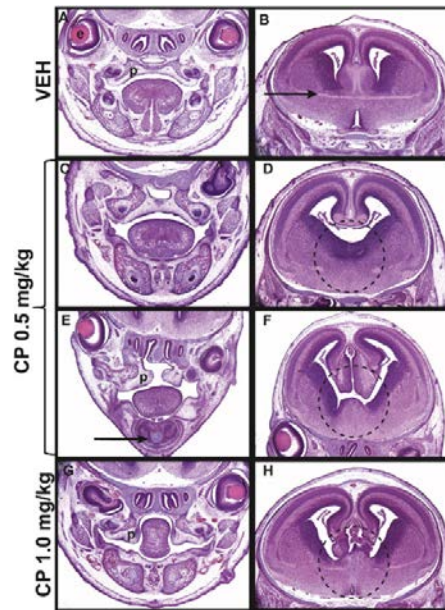
*BMJ Open* 2016;6:e009986 doi:10.1136/bmjopen-2015-009986

## **Prenatal exposure to cannabis and maternal and child health outcomes: a systematic review and meta-analysis**

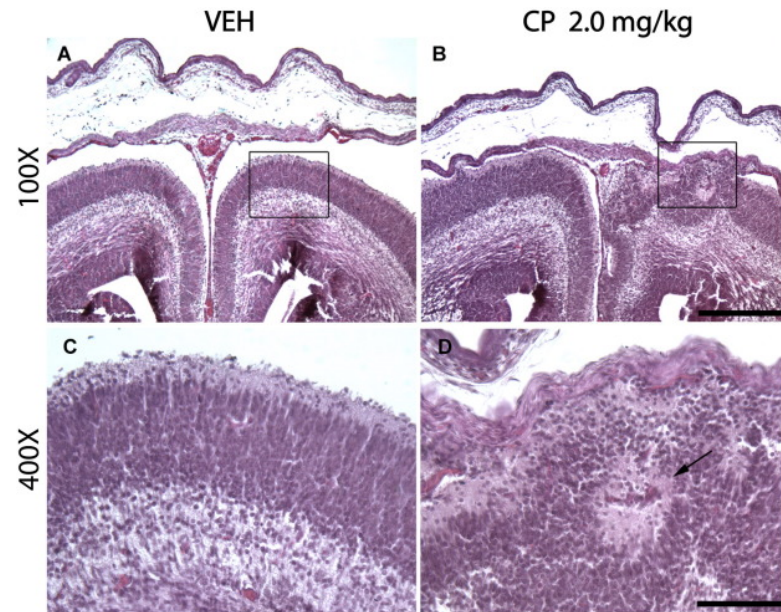
J K L Gunn<sup>1</sup>, C B Rosales<sup>2</sup>, K E Center<sup>3</sup>, A Nuñez<sup>4</sup>, S J Gibson<sup>5</sup>, C Christ<sup>6</sup>, J E Ehir<sup>5</sup>

Women who used cannabis in pregnancy had increased odds of anaemia (pooled OR (pOR)=1.36). Infants exposed to cannabis in utero had decreased birth weight (pOR=1.77) and more likely to need placement in the neonatal ICU (pOR=2.02).

# Dose-dependent Teratogenicity of the Cannabinoid Agonist CP-55,940 in mice



**Histological sections of control and CP 55,940-treated GD 17 fetal mice showing abnormalities of the brain, eyes, palate, and mandible.**



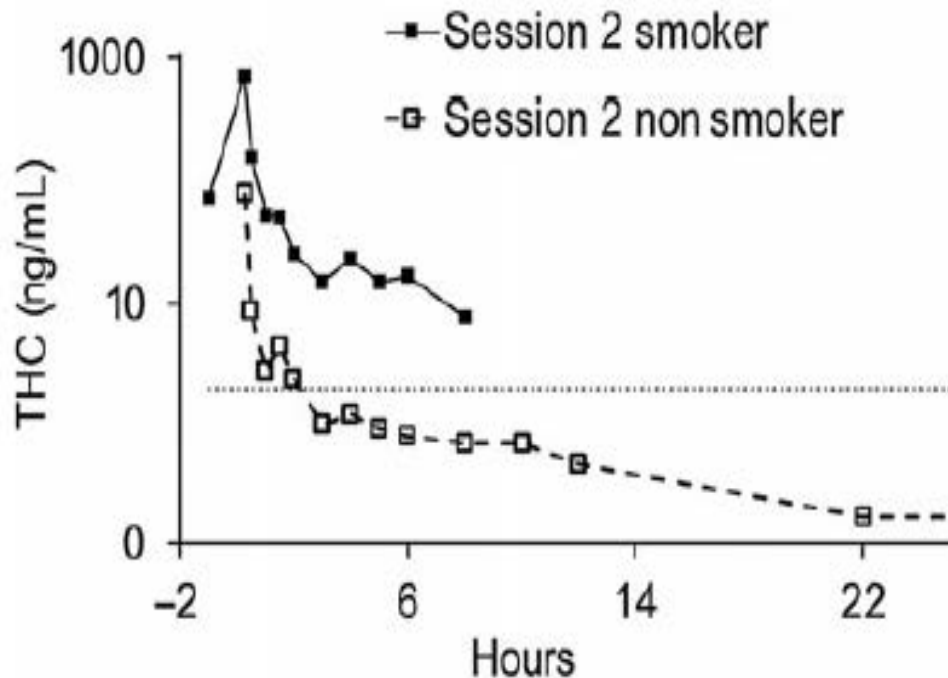
**Histological sections from control and fetus from a CP 55,940 treated mother. Notice severe dysplasia in left hemisphere of CP-55940-exposed fetus.**

*Marcoita et al., Neurotox Teratology, 2015.*

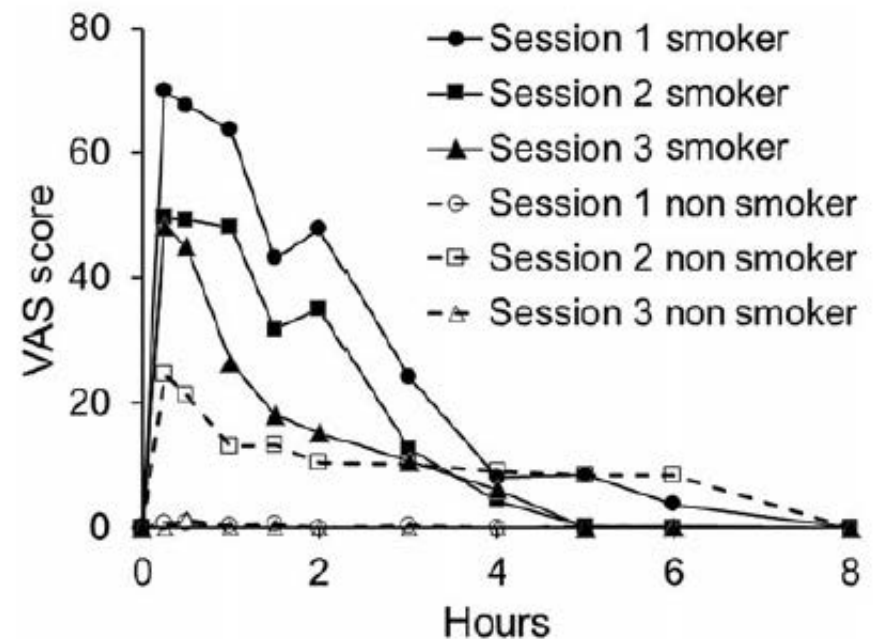


# Exposure to Secondhand Cannabis Smoke

## THC Concentration in Oral Fluid of Non-Smokers and Smokers



## Self-Reports of 'Pleasant Drug Effect' By Nonsmokers and Smokers



Cone EJ et al., *Journal of Analytical Toxicology* 2015;39:497–509.





UNITED STATES

Drug Enforcement Administration

TOUGH WORK, VITAL MISSION



***July 8, 2016 -- DEA NIDA Visit and Town Hall  
Acting Administrator Chuck Rosenberg***

***August 11, 2016 – DEA Press Release***

- **DEA Responds to Two Petitions to Reschedule Marijuana:** **Denies** **petitions** to reschedule marijuana under the Controlled Substances Act “.., **marijuana remains a schedule I** because it **does not meet criteria for accepted medical use in USA**, there is **a lack of accepted safety for its use under medical supervision**, and **it has a high potential for abuse**.
- **Increase Number of Authorized Marijuana Manufacturers Supplying Researchers.** This will provide researchers with a more varied supply of marijuana. At present, only the University of Mississippi (operating under a NIDA contract) is authorized.



Adolescent Brain Cognitive Development  
*Teen Brains. Today's Science. Brighter Future.*

## **ABCD Update**

- New collaborations with CDC Division of Adolescent and School Health and the National Institute of Justice
- Multi-site pilot study conducted to refine and shorten protocol
- Site initiation visits underway

**Official Launch of ABCD Study Recruitment –  
September 1, 2016**

**Press Release Date – September 13, 2016**

**Congressional Briefing – September 19, 2016**

# New NIDA FOAs

## Avenir Award Program for Genetics or Epigenetics of Substance Use Disorders (DP1) [\(PAR-16-357\)](#)

*Application Due Date(s): October 19, 2016; October 19, 2017; October 19, 2018.*

- *Support early stage investigators proposing highly innovative studies on genetics or epigenetics of addiction; including novel methods or approaches.*
- *Investigators outside the field of addiction are encouraged to apply.*
- *May lack the preliminary data required for an R01*
- *Propose high impact research*
- *Investigators show promise of being tomorrow's scientific leaders in genetics or epigenetics of SUD.*

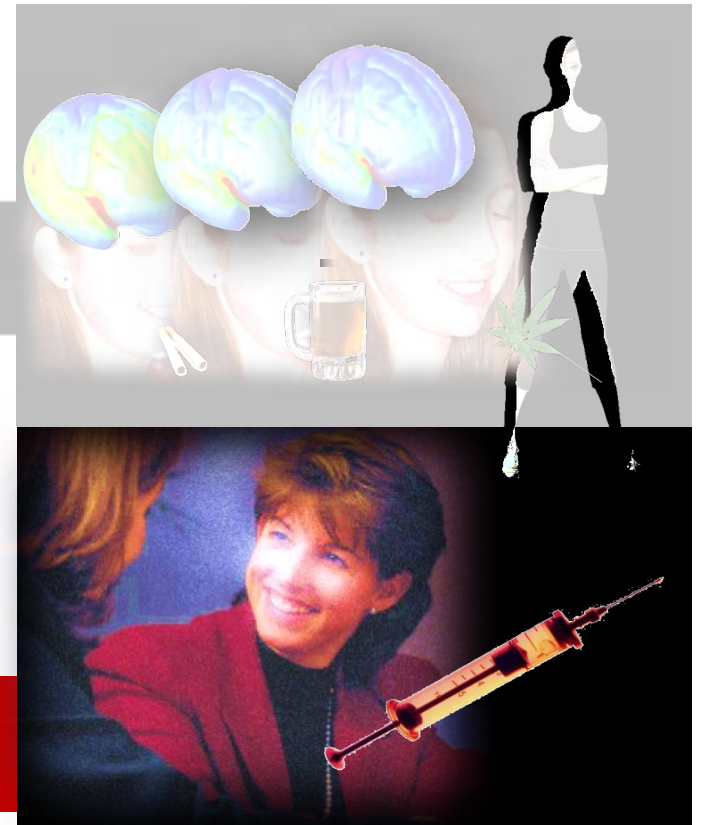
# Priority Areas

## Prevention Research

(Children & Adolescents)  
genetics/epigenetics  
development  
environment  
co-morbidity

## Treatment Interventions

(New Targets & New Strategies)

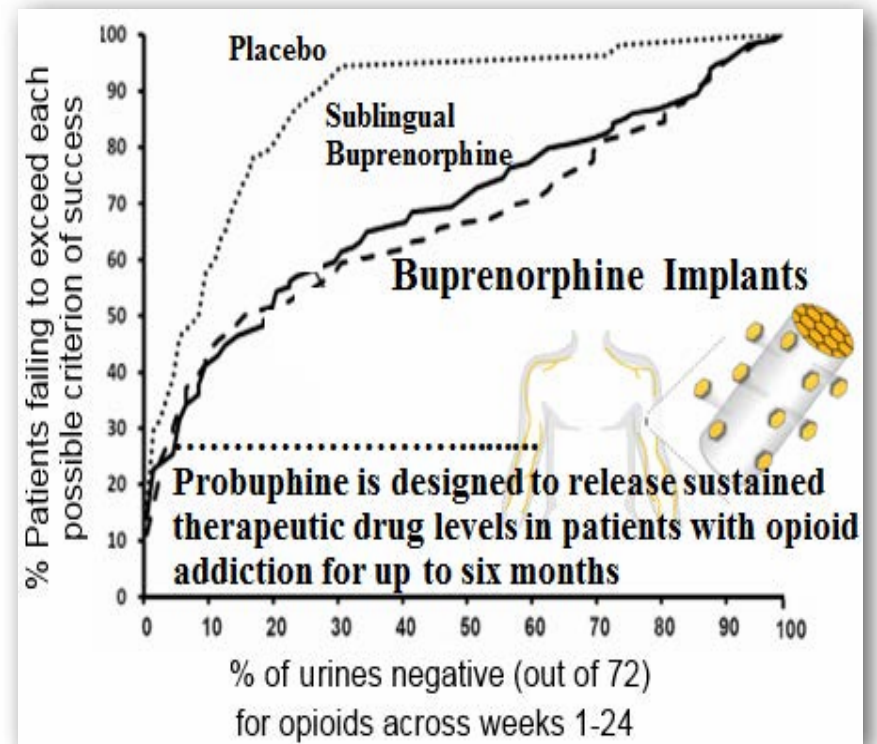


# ***Improving Treatments for Addiction:***

## ***Extended Release Medications Improve Compliance***

- Implanted buprenorphine may improve compliance
  - Trial: buprenorphine implants vs. placebo for 6 months

**FDA approval – May 26, 2016**

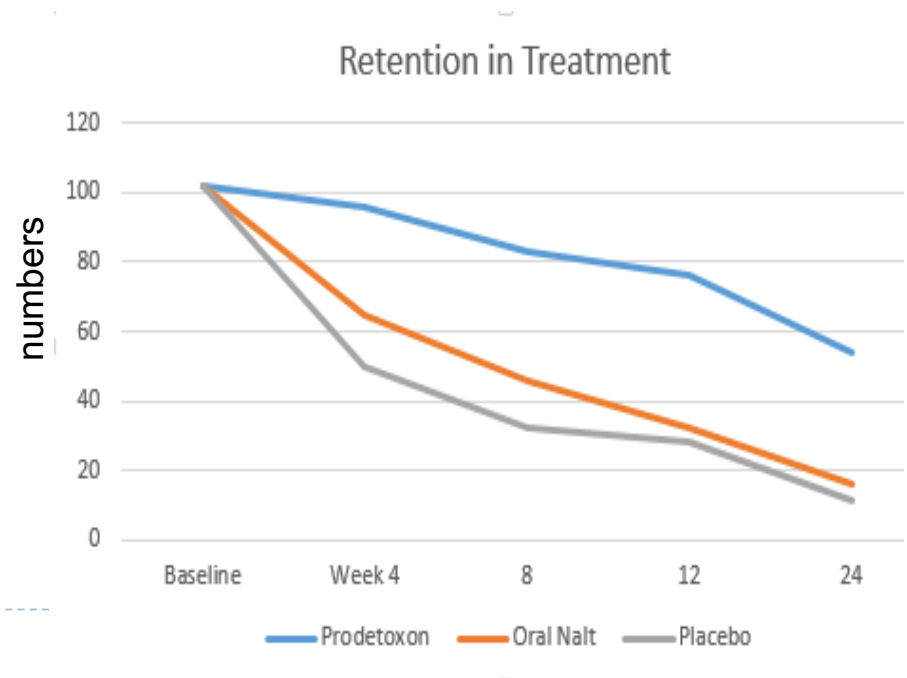


Rosenthal et al. *Addiction*. (2013)

# Anhedonia, Depression, Anxiety, and Craving In Opiate Dependent Patients Stabilized On Oral Naltrexone Or An Extended Release Naltrexone Implant

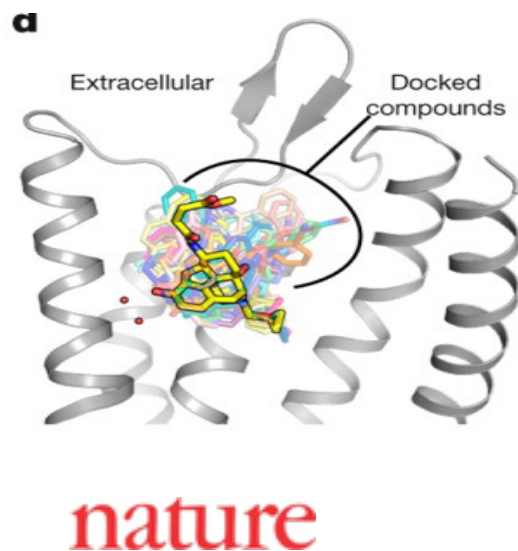
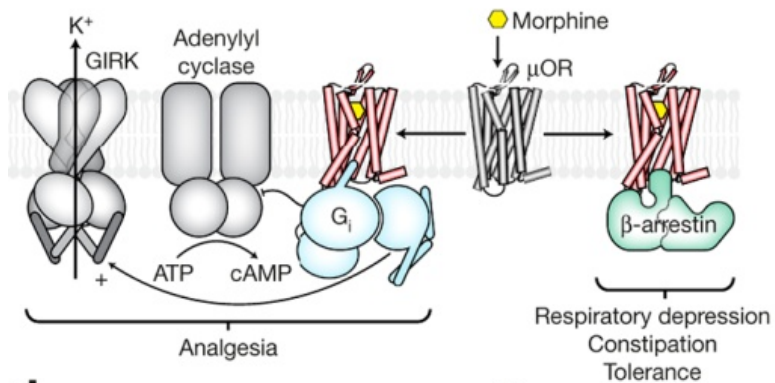
- Opioid dependent patients in Russia
- Double blind Randomized Clinical Trial for 6 months (102ss/cell)
  - 1 .Extended release implantable naltrexone (Prodetoxon®) q. 2 m.
  2. Oral naltrexone (Antaxone®) 50 q.d.
  3. Matched placebo (oral and implant)
- Monthly assessments
- Riboflavin to monitor adherence

**Neither oral nor implantable naltrexone increased craving, depression, anxiety or anhedonia in patients who continued treatment and did not relapse**



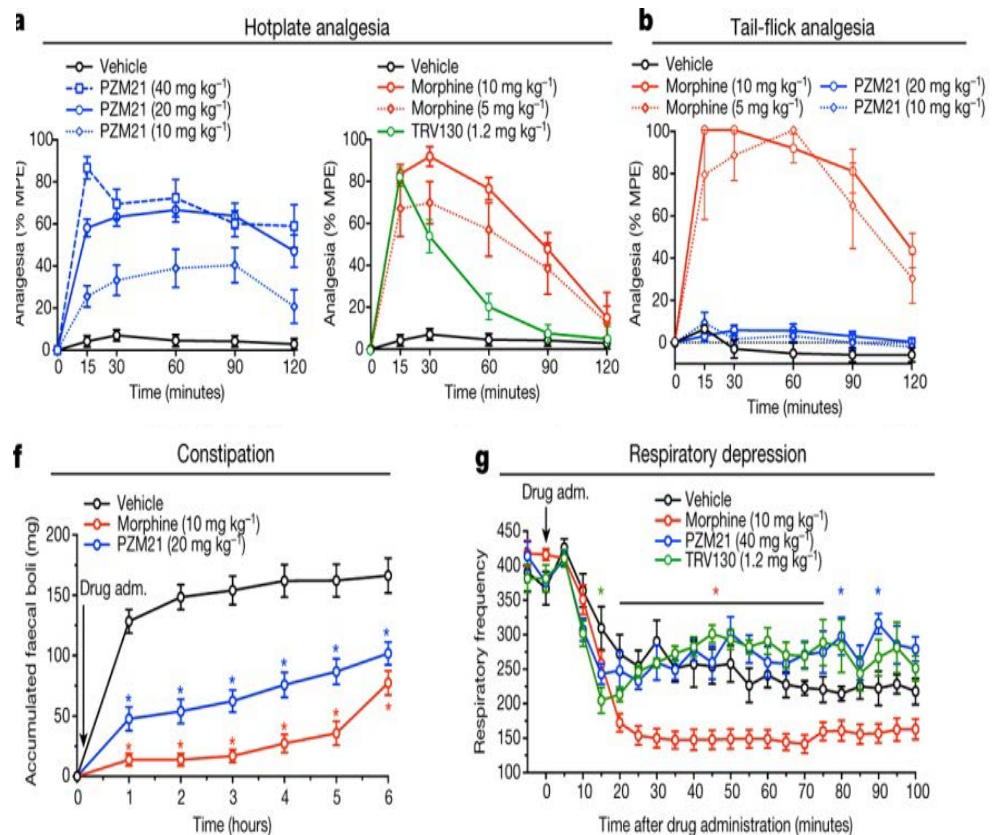


# Structure-based Discovery Of Opioid Analgesics With Reduced Side Effects



A Manglik et al. Nature 1–6 (2016)

## PZM21 is an analgesic with reduced liabilities



# Priority Areas

## Prevention Research

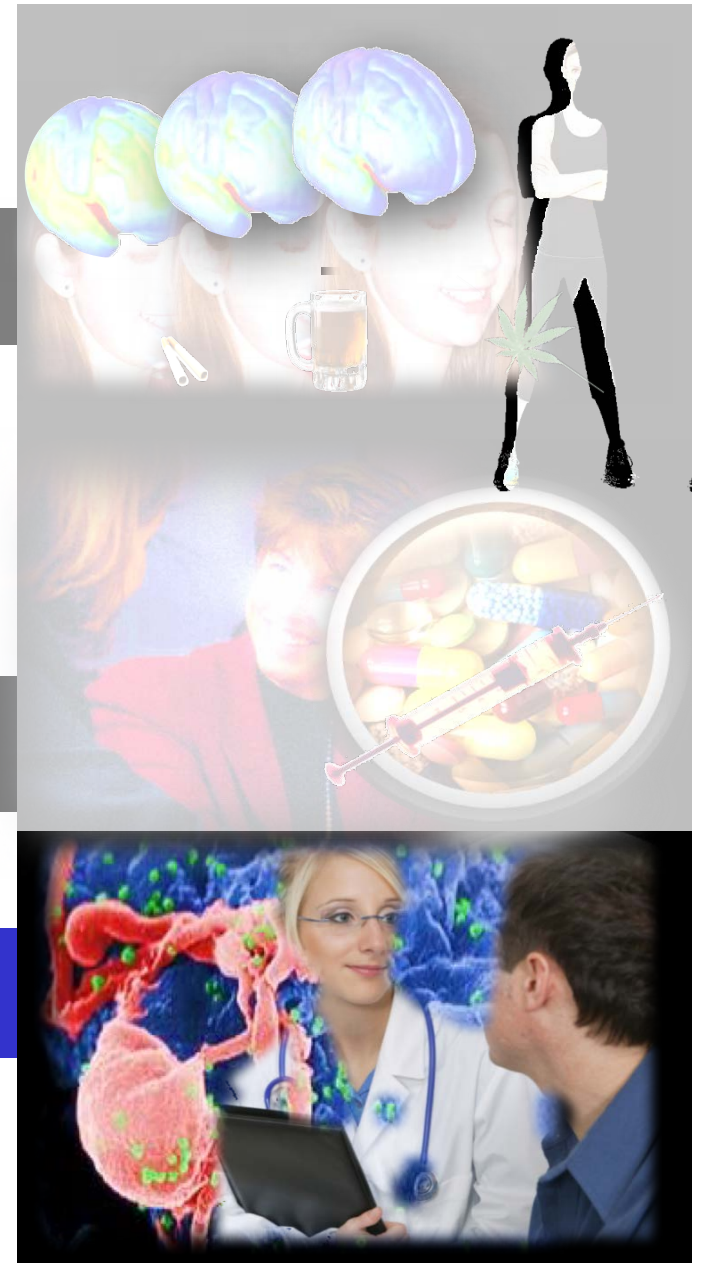
(Children & Adolescents)  
genetics/epigenetics  
development  
environment  
co-morbidity

## Treatment Interventions

(New Targets & New Strategies)

## HIV and Drugs

Prevention  
Treatment





# NIH Overarching AIDS Research Priorities

(August 12, 2015)

1. Reduced **incidence**, including vaccines
2. Next generation of HIV therapies with better safety and ease of use
3. Research toward a cure
4. HIV-associated **comorbidities** and co-infections

*Cross cutting areas:* Basic research, **health disparities**, and training

**Extramural:** OAR reviewed 1,207 grants eligible for 2016 renewal.  
242 grants were low priority (\$65.2M); \$14.2M from NIDA.

**Intramural:** OAR reviewed 56 projects  
26 projects were low priority (\$6.6M); \$3.3M from NIDA.



# New NIDA FOAs

**Mechanisms of Immune Activation and Inflammation:  
HIV Infection, ART, and Drugs of Abuse (R01) ([RFA-DA-17-013](#))**

*Application Due Date(s): November 18, 2016.*

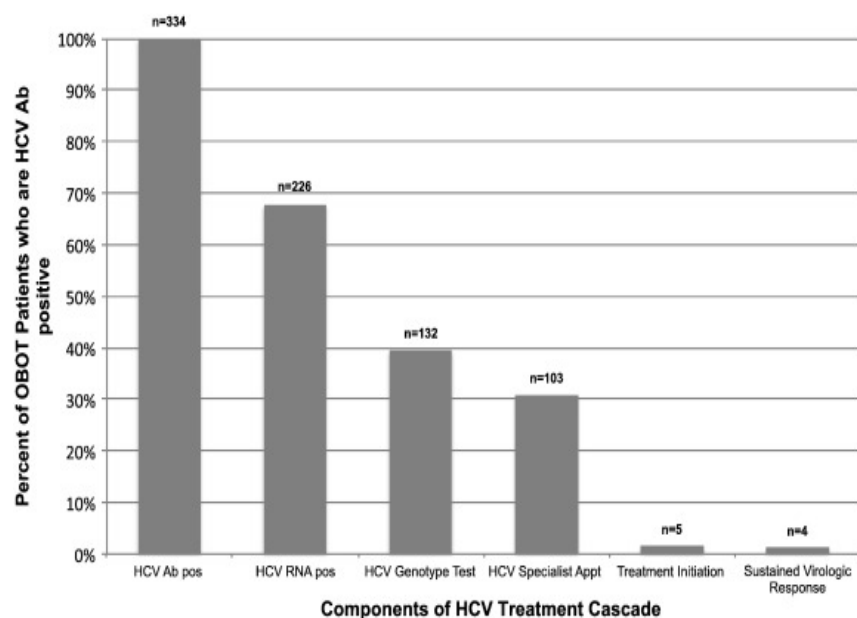
***Research on molecular mechanisms of HIV infection-induced immune activation and inflammation in the presence of antiretroviral therapy (ART) agents and drugs of abuse.***

**Silencing of HIV-1 Proviruses (R61/R33) ([RFA-AI-16-038](#))  
(with NIAID & NIMH)**

*Application Due Date(s): December 7, 2016.*

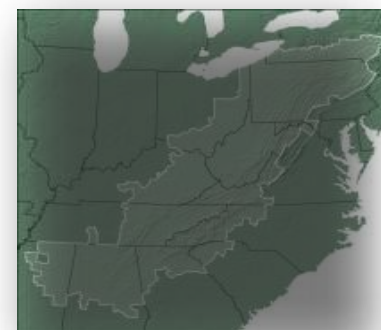
***Exploratory and developmental research on identification and optimization of small molecules or RNAs that interact with host epigenetic machinery to mediate long-term or permanent epigenetic silencing of HIV-1 proviruses.***

## Hepatitis C Virus Testing & Tx Among Persons Receiving Buprenorphine in an Office-Based Program for Opioid Use Disorders



**HCV treatment cascade among HCV+ patients in Office Based Opioid Treatment (n = 334).**

## NIDA-Appalachian Regional Commission (ARC) Partnership



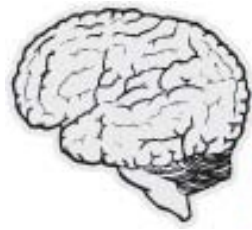
*Fund grants to address increased opioid IDU OD, HIV and HCV*

- One-year planning grants to:
  - problem's scope; contributing health trends
  - Identify resources, obstacles
- 4 Grants Expected to be Funded by 30 September: RFA-DA-16-015

**Broaden program for FY2017 with ARC to include CDC and SAMHSA**

*Katelyn et al., Journal of Substance Abuse Treatment, Volume 66, 2016, 54–59.*

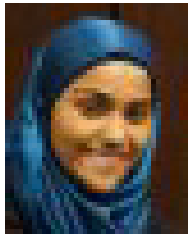
# 2016



## ADDICTION SCIENCE AWARD

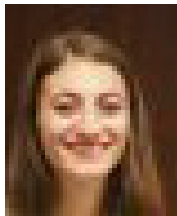


**1<sup>st</sup>**



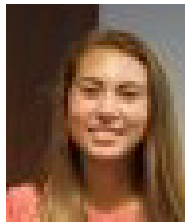
***Making the Mind Matter: Stress Mindset Effects on Sleep Quality, Stress Response, Emotion and Cognition in the Developing Adolescent Brain and the Role of the Prefrontal-Amygdala Circuit***  
**Kashfia Rahman--Brookings High School in Brookings, SD**

**2<sup>nd</sup>**



***Effects of E-Cigarette Vapor on *Drosophila melanogaster****  
**Lindsay Poulos --Episcopal School of Jacksonville in Jacksonville, FL**

**3<sup>rd</sup>**



***Development of a Caffeine Addiction Paradigm to Examine How Dietary Restriction and Level of TOR Signaling Modulate the Effects of Drugs***  
**Rachel Mashal -- John F. Kennedy High School in Bellmore, NY**

# Recent and Upcoming Congressional Activities

**5/12/16**      **AAAS Briefing on *Marijuana***

**6/22/16**      **Congressman Dold – *Topic: Opioids***

**6/30/16**      **ACNP Senate Briefing on *Opiate Addiction & Overdose***

**7/26/16**      **Senator Thad Cochran's  
Staff Visit to NIH – *Topic:  
Marijuana***

**9/9/16**      **Congressman Blumenauer**

**9/19/16**      **FON Hill Briefing on *ABCD Study***





## Preliminary Agenda

### *Relapse and Recovery: from Mechanistic Understanding to Translational Research*

- Session I. Drug Memory and Molecular Drivers of Relapse
- Jacob P. Waletzky Memorial Award Lecture
- Joint NIDA-NIAAA Early Career Investigator Showcase [ECIS]
- Session II. Circuit Mechanisms of Relapse
- Session III. Relapse risk and treatment